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EFFECTS OF RESISTANCE AND AEROBIC EXERCISE ON PHYSICAL SELF-
EFFICACY AND SOCIAL PHYSIQUE ANXIETY IN FEMALE COLLEGE
STUDENTS

by

MICHELE Y. MARTIN

(under the direction of A. Barry Joyner)

ABSTRACT

This study examines the effects of resistance and aerobic exercise on Social Physique Anxiety (SPA) and Physical Self-Efficacy (PSE) over a 3-week time period. Participants ($n = 44$, mean age = 21.11 years) were randomly assigned to one of four treatment groups: Aerobic, Resistance, Combination, or Control. Measures of SPA and PSE were taken at baseline and after the 3-week period. Two-way ANOVAs revealed a significant difference in SPA, confidence, and ability over time across all groups.

INDEX WORDS: Social physique anxiety, Physical self-efficacy, Resistance, Aerobic, Exercise, Confidence

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B.S., Georgia Southern University, 2003

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A Thesis Submitted to the Graduate Faculty of Georgia Southern University in Partial
Fulfillment of the Requirements for the Degree

MASTER OF SCIENCE

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STUDENTS

by

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DEDICATION

For waiting patiently as I diligently worked to finish my master's degree. For spending many nights learning how to cook and clean the house when I didn't have time to do so. Thank you for your patience and encouragement when I wanted to quit.

I dedicate this thesis to my husband, Luke Martin.

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INTRODUCTION

There is an overwhelming amount of emphasis on physical appearance in the world today, especially from the media. The media has an incredible influence in peoples' lives. According to a recent survey of adolescent girls, the media was their main source of information about women's health issues ("The Media", 2002). A study of one teen magazine over the course of 20 years revealed that 74% of girls cited "becoming more attractive" as a reason to exercise, and 51% cited the need to lose weight or burn calories. Perhaps this phenomenon, to be accepted by society, starts at a much earlier age than previously thought. Another important finding was the number of weight loss advertisements found in women's magazines compared to men's magazines. Women's magazines had 10.5 times more advertisements promoting weight loss than men's magazines. Also, they examined 4,294 commercials and found that 1 in every 3.8 commercials sends some sort of attractiveness message.

This emphasis by the media on physical appearance may create a drive for thinness in females today. Many women, young and old, strive to have a perfect body. One could conclude a drive for thinness could indicate body image problems in an individual.

Throughout history women's bodies have been "molded" to fit the ideal of the current time period. In the 50's and 60's there was Marilyn Monroe and Jayne Mansfield, both of whom were approximately 5'8" and weighed 132 lbs. Society liked "curvy" women with a larger bust and hip size. In the 70's and 80's women were taller, thinner, with highly toned muscles and little visible body fat. These models were 5'8" and weighed 117 lbs. During this time many women were looking up to Jane Fonda and

Denise Austin. In the early 90's adult women looked pre-teen; very tall and very thin. They measure in at 5'10" and 110 lbs (Body Image, 1994). In the late 90's one started seeing women with narrow hips and very large breasts, something that was not achieved without breast enhancements. These models were 5'10" and weighed 110 lbs. The weights mentioned previously are 13-19% less than the average woman.

Voracek and Fisher (2002) studied Playboy centerfolds of 577 consecutive monthly issues from 1953 to 2001. They analyzed anthropometric data such as: height, weight, bust, waist, and hip measurements. Then, they calculated body mass index, waist to hip ratio, waist to bust ratio, and bust to hip ratio. They found significant correlations over time with the issue number, meaning as issue number increased, BMI decreased. Therefore, as the issue number increased the model was getting taller. Furthermore, the models were appearing thinner and leaner.

Playboy magazine allowed Garner, Garfinkel, Schwartz, and Thompson (1980) to extract height, weight, and measurement data of 240 monthly playmates who had been seen in the magazines over the past 20 years. The average weight of the playmates was compared to population means. The mean weight for the playmates was significantly lower than the population means'. However, most alarming, were the changes within the playmate's sample. Regression analysis revealed that the percent of weight for age and height significantly decreased over 20 years. Additionally, waist measurements increased while bust and hip measurements decreased.

Garner et al. (1980) also studied Miss America pageant contestants. Height, weight, and age were extracted from pageant winners and contestants over a 19 year period. Results revealed there was a decline in weight of .13 kg per year for the

contestants and a .17 kg per year decrease for the winners. Overall, the pageant winners have weighed significantly less than the other contestants.

In today's society, a woman's thinness is equated with her beauty, fitness, and health. Therefore, it is not surprising that many women experience body and weight dissatisfaction. A study conducted in 1985 revealed 30% of women had an unfavorable evaluation of their body (Paquette, Leung, Staats, & Raine, 2002). That number grew to 48% by 1995. This phenomenon is not exclusive to the young or eating disordered.

Many companies use pictures of thin, beautiful women or shirtless buff men in their advertisements. An example would be advertisements for diet pills or any weight loss product. Instead of focusing on health benefits of weight loss such as improved sleep habits, improved energy levels, decreased risk of cardiovascular disease, and increased physical functioning, among others, the companies' advertisements focus on how one would look after use of their product. One university in Indiana recently changed the way it advertises its fitness programs (C. Kennedy, personal communication, April, 2004). The university changed its group exercise class names to make sure they do not mention a body part. The university also changed posters on bulletin boards to focus on psychological successes rather than physiological successes associated with exercise. Through doing this, group exercise class participation increased 25% as well as overall participation in other fitness programs.

One may conclude that such emphasis on beauty and attractiveness may lead women to steadily feel they do not measure up to standards of society. Furthermore, this emphasis often leads to feelings of sadness and worthlessness, ultimately leading to

depression. Exercise has been proposed as a treatment for depression, which is twice as prevalent in women as in men (National Mental Health Association, 2000).

Many people are motivated to exercise for aesthetic reasons. Far too often, people exercise to achieve a certain look in order to make a good impression on somebody else. Furthermore, they exercise to avoid negative evaluations made of their body. A few of the physiological goals may include weight control and appearance reasons (Williams & Cash, 2001). However, another goal may include improving body image, which is associated more with psychological well-being than with physiological well-being.

According to Monteath and McCabe (1997), body image involves both a perceptual and an attitudinal component. To measure the relationship between societal factors and body image, they tested a non-clinical sample of 101 Australian women. The participants were asked to adjust an image, which appeared on a television screen, to represent her perceived body size. Each participant was also asked to adjust the image on the screen to represent the societal ideal. Results revealed that many participants expressed a strong desire to be smaller than their perceived sizes, very few were content with their current sizes, and a small number expressed a desire to be larger.

Self-efficacy and social physique anxiety (SPA) are closely related to body image. SPA refers to discomfort people may feel due to others' observations or evaluations of their physique (Williams & Cash, 2001). Self-efficacy refers to the belief in one's capabilities to produce designated levels of performance that exercise influences over events that affect the individual's life (Bandura, 1977). Exercise may play a role in reducing SPA (Hart, Leary, & Rejeski, 1989). Self-efficacy may also improve as fitness levels improve due to competence-based feedback (Williams & Cash, 2001). In order to

improve self-efficacy, one needs to experience feelings of mastery. Many variables associated with exercise can contribute to feelings of mastery, including learning how to monitor exercise behaviors, setting short and long term goals, and receiving positive feedback from the exercise instructor (Craft, 2005).

There are numerous studies that suggest aerobic exercise has a positive effect on mood, SPA, physical self-efficacy, cognitive functioning, anxiety levels, and overall quality of life (Dishman, 2003; Eklund & Crawford, 1994; Hale & Raglin, 2002; McAuley & Katula, 1998). In contrast, the effect of resistance exercise on such psychological factors has received little attention. However, recent studies have shown a positive effect on the previously mentioned variables.

Craft (2005) recruited 21 clinically depressed women to participate in a nine week study to examine the antidepressant effects of exercise. Results revealed a significant reduction in depression from start of the study to week three for the exercise group. There was no further reduction from week three to week nine; however, the reduction was maintained. A significant improvement in self-efficacy was seen by week three in the exercise group; however, no improvement was seen by the control group. Furthermore, a reduction in depression seems to be associated with a moderate intensity exercise program of three days per week (Craft, 2005).

Bartholomew and Linder (1998) recruited 20 undergraduate exercise science students to participate in a structured exercise program which included resistance training. Results revealed that following a low-intensity exercise session, men's anxiety levels decreased over time. Post hoc tests revealed anxiety was no different from baseline values at 5 or 15 minutes following exercise, but showed a significant difference at 30,

45, and 60 minutes following exercise. Anxiety levels did drop below baseline values at those times. However, there were no significant findings to suggest decreased anxiety levels for moderate-intensity exercise or high-intensity exercise for men or women.

Williams and Cash (2001) recruited 39 participants to perform a 6-week circuit weight training class. Participants were placed in groups according to their previous and current aerobic exercise levels. A sample of control subjects were chosen to match the participants on gender, age, race, BMI, and level of previous or current aerobic exercise. Afterwards, participants completed multiple questionnaires related to appearance evaluations, body satisfaction, physical self-efficacy, and SPA. Body image improved on all four measures. Therefore, resistance exercise had a positive effect on participants' evaluations of their physical appearance, on their body satisfaction, SPA, and physical self-efficacy.

Today's culture has traditionally viewed strength training as a masculine activity and promoted a small, somewhat frail body as feminine; therefore, women have been discouraged from participating in resistance exercise. Typically, when women have been found participating in resistance training, they were doing it to enhance their performance in a particular sport (Ebben & Jensen, 1998). Furthermore, there remains a need to investigate effective interventions to help women struggling with body image. The purpose of this study is to see if resistance training affects self-efficacy and SPA in female college students.

METHOD

Participants

Fifty-eight sedentary, college-aged, female students ranging from freshman to graduate students were recruited from various academic classes to participate in a three-week, randomized exercise trial. These participants were taken from an ethnically diverse university located in the southeastern region of the United States. The academic classes included three Psychology, two Introduction to Food Science, two Child and Family Development, and two Kinesiology classes. Criteria in order to participate in the study included: (a) aged 18 to 25 years, (b) sedentary, defined by a lack of regular exercise during the previous six months, and (c) apparently healthy individuals based on American College of Sports Medicine/American Heart Association Risk Stratification (ACSM's Guidelines for Exercise Testing and Prescription, 2000). The individual is classified as apparently healthy if she has no symptoms of disease, no known disease, and no cardiovascular risks. All procedures were approved by the University Institutional Review Board. Each participant read and signed a statement of consent before completing the questionnaire. Each participant was made aware that she was granting consent to have her information used in further research and/or presentations while respecting confidentiality. Forty-four students of the initial fifty-eight actually completed the three-week experiment. The participants had a mean age of 21.11 years ($SD = 1.56$)

The sample was 60% Caucasian ($n = 26$), 37% African American ($n = 16$), and 2% Other ($n = 1$). Six percent were freshman ($n = 3$), 13% were sophomore ($n = 6$), 40.9% were juniors ($n = 18$), 36% were seniors ($n = 16$), and 2% were graduate students ($n = 1$). Participants were at a relatively healthy weight category when compared to body

mass index (BMI) standards. Four participants scored above 29.9 kg/m^2 , which is considered to be obese (ACSM, 2000), and one was underweight (mean BMI = 23.05 ± 3.97), which is defined as 18.5 kg/m^2 and below. Mean waist to hip ratio was .76 ($SD = .05$), therefore participants were considered to have low health risk (.85 and below) (ACSM, 2000).

Instrumentation

The participants used resistance equipment manufactured by Life Fitness, Freemotion, and Precor located in a university weight room. All equipment was well maintained and was in safe working order. Equipment used in the experiment included leg extension, leg curl, leg press, lat pulldown, chest press, overhead shoulder press, bicep curl, tricep extension, abdominal crunch, back extension, treadmill, elliptical, and stationary bicycle.

The questionnaires used were the Physical Activity Readiness Questionnaire (PAR-Q), Physical Self-Efficacy (PSE) Scale and SPA (SPA) Scale. The PAR-Q consists of seven yes/no questions regarding the health of the participant. The PSE consists of a 10-item Perceived Physical Ability (PPA) subscale and a 12-item Physical Self-Presentation Confidence (PSPC) subscale. Higher scores on the PPA indicate a higher perceived physical ability, and higher scores on the PSPC reflect greater confidence in presentation of physical skills. Higher values on the PSE indicate a stronger sense of physical self-efficacy. Reliability alphas are 0.84 for the PPA, 0.74 for the PSPC, and 0.81 for the PSE. Test-retest reliability and convergent, concurrent, discriminant, and predictive validity on the PSE and its subscales are good (Williams & Cash, 2001).

The SPAS is a 7-item scale in which individuals respond to statements about the amount of anxiety they feel when others observe or evaluate their physiques. Scores range from 7 to 35 with higher scores indicating greater anxiety. The SPAS has a reported internal reliability of $\alpha = .89$ (Martin, Leary, O'Brien, McAuley, & Bane, 1997). Hart et al. (1989) have demonstrated construct validity of the SPAS through moderate correlations with measures that include fear of negative evaluation ($r = .35$) and body cathexis ($r = .51$). The SPAS has a test-retest reliability of $R = .94$ (Scott, Burke, Joyner, & Brand, 2004). According to Motl and Conroy (2000), researchers can confidently employ the 7-item SPAS in studies among female and male teenagers and young adults.

Procedure

The researcher selected nine academic classes from which to recruit the participants. The participants received extra credit in those classes for participating in eight of nine exercise sessions. The students completed the demographic questionnaire, thereby consenting to participation in the experiment. Students that met the selection criteria were then assigned to the treatment groups: Aerobic, Resistance, Combination, or Control. Waist and hip circumference measurements were then taken on the participants. Participants were informed of the general purpose of the study and were made aware which treatment group they were assigned to and instructed to complete the assigned exercise activity over a three-week period. Participants were assured both verbally and through the statement of consent that their identity would remain anonymous. Once participants agreed, they were randomly assigned to one of four groups: an Aerobic Activity Group, a Resistance-Training Group, a Combination Group, or a Control Group. Participants were instructed during an introductory session, according to their assigned

group, on safety and operation of equipment to ensure they knew how to execute the activity properly and the appropriate weight to lift. The participants were also instructed to sign in and out for the exercise session with weight room supervisors. The weight room supervisors would then monitor them as they exercised. The Aerobic Activity Group was instructed to perform a warm-up on a treadmill for five minutes prior to participating in cardiovascular exercise including treadmill walking/running, bicycling, or cross country skiing on the elliptical three days/week for 30 minutes each day. The Resistance Training Group was instructed to perform a warm-up on a treadmill for five minutes prior to performing two sets of 10-12 repetitions, of a weight that is challenging to them, completing at least 10 repetitions but no more than 12 repetitions, of an exercise for each large muscle group including: quadriceps, hamstrings, latissimus dorsi, pectoralis, deltoid, bicep, tricep, and abdominals. Exercises included the leg extension, prone leg curl, lat pulldown, chest press, overhead shoulder press, bicep curl, tricep extension, and standing abdominal crunch. Participants were instructed to perform the resistance exercises three days/week for 30 minutes each day. The combination group participated in cardiovascular exercise as well as resistance-training. Participants were instructed to perform a warm-up on a treadmill for five minutes prior to participating in cardiovascular exercise including treadmill walking/running, bicycling, or cross country skiing on the elliptical three days/week for 15 minutes. They were also instructed to perform two sets of 10-12 repetitions of an exercise for each large muscle group including: quadriceps, hamstrings, latissimus dorsi, pectoralis, and abdominals. The exercises consisted of the leg press, lat pulldown, chest press, and standing abdominal crunch. The participants were instructed to perform the resistance routine for 15 minutes,

three days/week. The control group was instructed to continue activity habits as normal. Because sedentary lifestyle was an inclusion criterion the control group participants were not expected to be exercising on a regular basis. Prior to and following the three-week period, participants completed assessments of SPA and physical self-efficacy.

Data Analysis

Descriptive statistics, including frequency and means, were used to describe the sample. The exercise training program was the independent variable. Dependent variables were SPA, PPA and PSPC. Three two-way ANOVA's with repeated measures were used to determine if resistance exercisers' scores on SPA, PPA and PSPC change more than non-resistance exercisers scores ($\alpha = .05$).

RESULTS

Of the initial 58 participants entering the experiment, 44 individuals completed the three-week exercise regimen for an overall adherence rate of 75.8%. Attendance rates did not differ greatly between the treatment groups (resistance = 9, aerobic = 13, combination = 12, and control = 10). There were 43 participants that completed 8 days of the exercise program and 1 participant completed 9 days.

A two-way ANOVA with repeated measures showed no significant Group x SPA interaction ($p = .203$). There was a significant SPA effect ($p = .013$). Overall, SPA scores significantly decreased from pre to post (see Table 1), $F(1, 40) = 6.72$, $p = .013$. There was no significant Group effect ($p = .794$).

Table 1 – Comparisons of SPA pre and SPA post between groups.

	Group	Mean	Standard Deviation	N
SPA PRE Total	Resistance	18.89	5.90	9
	Aerobic	20.62	6.01	13
	Combo	20.25	7.77	12
	Control	16.50	7.99	10
	Total	19.23	6.92	44
SPA POST Total	Resistance	15.22	5.33	9
	Aerobic	17.15	4.62	13
	Combo	17.33	6.07	12
	Control	17.60	7.35	10
	Total	16.91	5.72	44

There was no Group x Ability interaction ($p = .302$) or group effect ($p = .755$). However, there was a significant Ability effect ($p = .007$). Ability scores significantly increased over time across all groups (see Table 2).

Table 2 - Comparisons of ability pre and ability post between groups.

	Group	Mean	Standard Deviation	N
Ability Pre	Resistance	41.44	6.95	9
	Aerobic	41.15	6.73	13
	Combo	37.50	8.49	12
	Control	40.20	5.71	10
	Total	40.00	7.03	44
Ability Post	Resistance	43.33	8.20	9
	Aerobic	45.31	6.81	13
	Combo	45.25	7.86	12
	Control	41.40	6.83	10
	Total	44.00	7.33	44

There was no Group x Confidence interaction ($p = .295$) or Group effect ($p = .963$). However, there was a significant Confidence effect ($p = .003$). Confidence scores significantly increased over time across all groups (see Table 3).

Table 3 - Comparisons of confidence pre and confidence post between groups.

	Group	Mean	Standard Deviation	N
Confidence Pre	Resistance	46.00	8.46	9
	Aerobic	46.08	6.81	13
	Combo	45.33	8.15	12
	Control	47.30	7.93	10
	Total	46.14	7.54	44
Confidence Post	Resistance	51.89	12.20	9
	Aerobic	49.92	7.09	13
	Combo	50.25	5.40	12
	Control	47.10	9.46	10
	Total	49.77	8.40	44

Experimental groups were formed based on the presence or absence of resistance or aerobic exercise. Therefore, the resistance and combination group would represent the presence of resistance exercise, while the aerobic and control groups would represent the absence of resistance exercise. Also, the aerobic and combination group would represent the presence of aerobic exercise, while the resistance and control groups would represent the absence of aerobic exercise. A between groups Two-way ANOVA was ran to examine the difference between experimental groups and the control group. As Figure 1 shows, a significant difference between experimental groups and the control group was found for SPA ($p = .032$). Figure 2 shows that confidence was approaching significance between the experimental groups and the control group ($p = .066$). Figure 3 shows there was no significant difference was found for ability ($p = .258$).

Figure 1: Estimated means of SPA difference score between experimental groups and the control group.

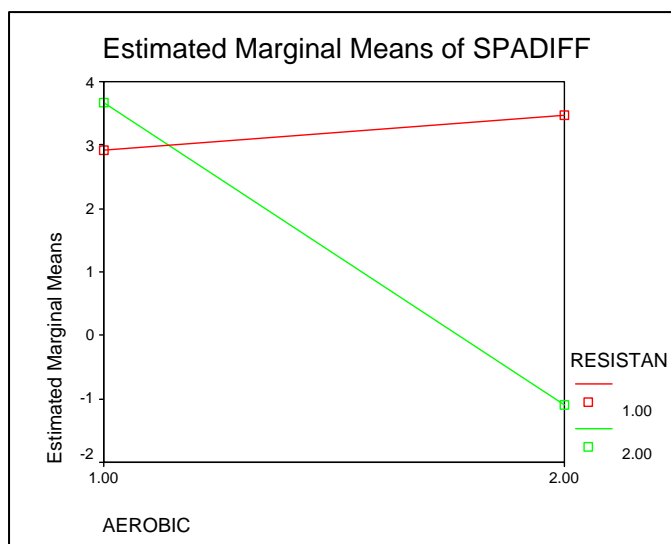


Figure 2: Estimated means of confidence difference score between experimental groups and the control group.

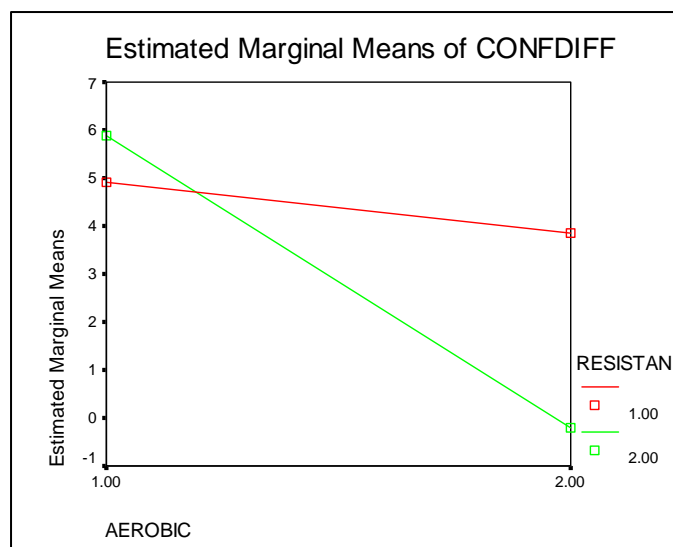
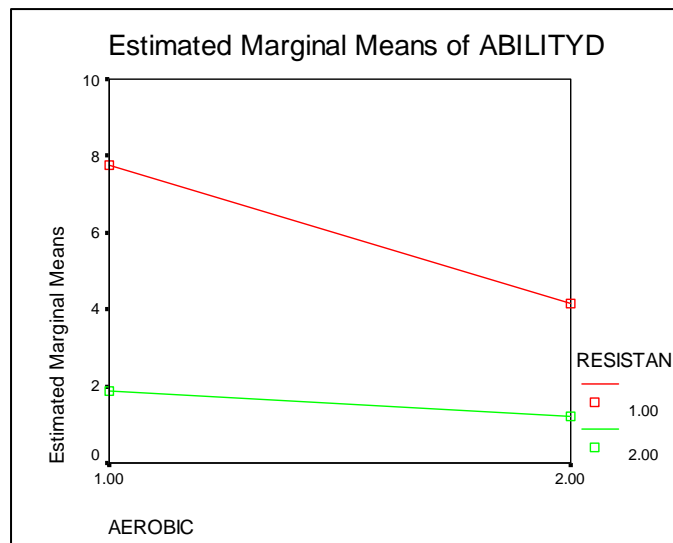


Figure 3: Estimated means of ability difference score between experimental groups and the control group.



Additionally, a significant difference for SPA between BMI groups existed ($p = .005$). BMI groups were formed based on underweight, normal weight, overweight, and obese. A BMI of 18.5 kg/m^2 and below would place one in an underweight category. A BMI of $18.5\text{-}24.9 \text{ kg/m}^2$ would place one in a normal weight category. A BMI of $25\text{-}29.9 \text{ kg/m}^2$ would place one in an overweight category and a BMI of 30 kg/m^2 and above would place one in an obese category. Participants' BMI scores were thrown out if the score was below 18.5 or above 29.9. One participant scored below 18.5 and four participants scored above 29.9. BMI groups were created (1 = $18.5\text{-}24.9$; 2 = $25.0\text{-}29.9$) to examine the differences in SPA. Overweight participants had significantly greater SPA compared to normal weight participants.

DISCUSSION

As hypothesized, participants reported significant improvements in SPA over time. All three groups experienced a decrease in SPA while the control group stayed the same. Although there was no interaction, SPA scores for the resistance group decreased more than the aerobic and combination groups from pre to post. It was hypothesized that the resistance exercisers would experience greater change than the aerobic exercisers for SPA. As shown in Table 1, resistance exercisers experienced the greatest improvements in SPA over time. It was also hypothesized that the combination group would have greater improvements in SPA than the aerobic, resistance, or control group. Once again, the resistance group experienced the largest change in SPA. The present findings support the conclusions from past research. The evidence that is available uses programs of six weeks in duration (Williams & Cash, 2001). The current data shows psychological improvements in only three weeks time. In as little as three weeks, one can experience significant decreases in SPA, leaving exercisers feeling better about themselves. This change is of particular interest with the growing emphasis on appearance by society.

Physical self efficacy is broken down into two subscales, confidence and ability. There was no significant group by confidence interaction. However, there was a significant confidence effect. All three groups experienced an increase in confidence over time, while the control stayed the same. It was hypothesized that the combination group would experience the greatest improvements in confidence. The resistance group seemed to have larger improvements in confidence than the aerobic and combination group. Because confidence means seemed to decrease across all groups over time, one may conclude a larger sample size in each group would lead to a significant group by

confidence interaction. Hypothesis #3 was not supported. Groups experience similar changes in PSPC and PPA.

The present findings support available evidence. Exercise has been shown to increase physical self efficacy (Miller, Ogletree, & Welshimer 2002). The current data shows there was no group by ability interaction. However, there was a significant ability effect. All groups, including control, experienced increases from pre to post. The combination group experienced the largest increases in ability from pre to post. Miller et al found the level of physical activity (low, moderate, vigorous) played a role in the physical self efficacy gain. This theory would explain the current results. One could conclude the combination group participated in the most vigorous exercise program.

As one can see through this study, it doesn't take long to see results from exercising. In only three weeks time one can see psychological improvements, but less physiological improvements. Obviously, participants are less anxious about his or her body after exercising. The participants were also becoming more confident. However, perceived ability was slower to improve.

Exercise clearly plays a role in the improvement of body image as well as PSE. More specifically, resistance exercise contributes to a reduction in SPA and an increase in confidence and ability.

The current findings expand on the findings of Craft (2005). Craft found that exercise played a role in the reduction of depression in clinically depressed people. However, the current study suggests exercise plays a role in the reduction of depressive symptoms in apparently healthy people. Both studies found significant results in just three weeks time. The findings of McAuley and Katula (1998), Eklund and Crawford

(1994), Hale and Raglin (2002), and Dishman (2003) are also supported. These researchers suggested exercise had a positive effect on SPA and PSE among other variables such as anxiety, cognitive functioning, and quality of life. McAuley and colleagues (2002) found physical activity to significantly reduce SPA over six months time in older adults. This finding is also supported through the current study, however, in a much shorter time period.

There is an important need to continue finding effective interventions for the growing number of individuals with body image concerns. The current study found exercise (resistance and aerobic) to play a key role in the reduction of SPA in a brief time of three weeks. No studies, that examined apparently healthy participants, were found to support the current findings in three weeks time

Most of the past research has focused on the role exercise in general plays in the reduction of SPA and the improvement of PSE. The current findings suggest resistance exercise has a similar effect on SPA and PSE than aerobic exercise. More research is needed to examine different types of exercise and its effect on such psychological variables. What type of exercise is most effective for improving SPA and PSE: Resistance exercise, aerobic exercise, a combination of both, or circuit-training. The length of time should also be expanded. If the current study had examined SPA and PSE over a six week period, more interactions may have been seen.

Certain limitations related to the study warrant caution when making conclusions and/or recommendations for future research. This study was limited to females from a Southeastern University between the ages of 18 and 25. The study also had a relatively low sample size in each group, therefore, contributing to a low statistical power. The

sample was a relatively homogeneous sample with regard to race, age, and education.

Perhaps, if the study were more random and accepted a broader field of participants, such as males and the uneducated, significant interactions would have been seen.

Perhaps a few implications could be made to further improve body image concerns in exercise facilities. One change could be refocused advertisements. Advertisements could focus more on the psychological, rather than the physiological, benefits of exercise. Facilities could also cater to a more diverse population to include the overweight and obese. A more diverse staff could be employed to attract a diverse population. For example, a facility could employ more hourglass figures than stick thin figures to teach fitness classes. If all fitness instructors are stick thin like models, participants equate being “fit” to looking like the fitness instructors. More fitness instructors should educate on “total” health rather than weight loss and toned thighs.

REFERENCES

- Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Journal of Personality and Social Psychology*, 35, 125-139.
- Bartholomew, J., & Linder, D. (1998). State anxiety following resistance exercise: The role of gender and exercise intensity. *Journal of Behavioral Medicine*, 21, 205-219.
- Body Image & The Media...What's the Connection. (n.d). Retrieved August 8, 2005 from <http://www.region.peel.on.ca/health/commhlth/bodyimg/media.htm>
- Craft, L. L. (2005). Exercise and clinical depression: Examining two psychological mechanisms. *Psychology of Sport and Exercise*, 6, 151-171.
- Dishman, R. K. (2003). The impact of behavior on quality of life. *Quality of Life Research*, 12, 43-49.
- Ebben, W. P., & Jensen, R. L. (1998). Strength training for women: Debunking myths that block opportunity. *The Physician and Sportsmedicine*, 26 (5).
- Eklund, R. C., & Crawford, S. (1994). Active women, SPA, and exercise. *Journal of Sport & Exercise Psychology*, 16, 431-448.
- Franklin, B. A. (2000). *ACSM's Guidelines For Exercise Testing and Prescription*. Philadelphia, PA.: Lippincott Williams & Wilkins.
- Garner, D. M, Garfinkel, P. E., Schwartz, D., & Thompson, M. (1980). Cultural expectations of thinness in women. *Psychological Reports*, 47, 483-491.
- Hale, B. S., & Raglin, J. S. (2002). State anxiety responses to acute resistance training and step aerobic exercise across 8-weeks of training. *Journal of Sports Medicine & Physical Fitness*, 42, 108-112.

- Hart, E. A., Leary, M. R., & Rejeski, W. J. (1989). The measurement of Social Physique Anxiety. *Journal of Sport and Exercise Psychology*, 11, 94-104.
- Kraemer, W. J., Volek, J. S., & Fleck, S. J. (2001). *ACSM's resource manual for guidelines for exercise testing and prescription*. In P. Darcy (Ed.), *Chronic musculoskeletal adaptations to resistance training* (pp. 176-183). Philadelphia, PA: Lippincott Williams and Wilkins.
- Martin, K., Leary, M., O'Brien, J., McAuley, E., & Bane, S. (1997). Is the Social Physique Anxiety Scale really multidimensional? Conceptual and statistical arguments for a unidimensional model. *Journal of Sport and Exercise Psychology*, 19, 359-367.
- McAuley, E., Marquez, D., Jerome, G., Blissmer, B., & Katula, J. (2002). Physical activity and physique anxiety in older adults: fitness, and efficacy influences. *Aging & Mental Health*, 6, 222-230.
- McAuley, E. & Katula, J. (1998). Physical activity interventions in the elderly: Influence on physical health and psychological function. *Annual Review of Gerontology and Geriatrics*, 18, 115-154.
- Miller, K., Ogletree, R., & Welshimer, K. (2002). Impact of activity behaviors on physical activity identity and self-efficacy. *American Journal of Health Behavior*, 26, 323-330.
- Monteath, S. A., & McCabe, M. P. (1997). The influence of societal factors on female body image. *Journal of Social Psychology*, 137, 708-727.

- Motl, R. W., & Conroy, D. E. (2001). The SPA Scale: Cross validation, factorial invariance and latent mean structure. *Measurement in Physical Education and Exercise Science*, 5, 81-95.
- National Mental Health Association. (2000, March). Depression in women. Retrieved October 24, 2005, from <http://www.nmha.org/infoctr/factsheets/23.cfm>
- Paquette, M. C., Leung, R., Staats, H., Raine, K. (2002). Development of a body image program for adult women. *Journal of Nutrition Education & Behavior*, 34, 1499-4046.
- Scott, L. A., Burke, K. L., Joyner, A. B., & Brand, J. S., (2004). Examining the stability of the 7-item SPA Scale using a test-retest method. *Measurement in Physical Education and Exercise Science*, 8, 57-62.
- The media, body image, and eating disorders. (n.d.). Retrieved March 17, 2005, from <http://www.nationaleatingdisorders.org/p.asp?>
- Voracek, M., & Fisher, M. L. (2002). Shapely centerfolds? Temporal change in body measures: Trend analysis. *British Medical Journal*, 325, 1447-1448.
- Williams, P. & Cash, T., (2001). Effects of a circuit weight training program on the body images of college students. *International Journal of Eating Disorders*, 30, 75-82.

APPENDICES

APPENDIX A

Research Hypotheses, Limitations, Delimitations, Assumptions, and Operational

Definitions

Research Hypotheses

1. It is anticipated that resistance exercisers will experience a significantly greater effect on SPA and Physical Self Efficacy than aerobic exercisers.
2. The combination group is anticipated to have a greater improvement in SPA and Physical Self Efficacy than the resistance group or the aerobic group.
3. In addition, the groups are hypothesized to experience a greater change in the Physical Self-Presentation Confidence subscale than in the Perceived Physical Ability subscale of the PSE.
4. It is also hypothesized that the control group will experience no change.

These hypotheses will be tested using questionnaires including SPA Scale (SPAS) and Physical Self-Efficacy Scale (PSE).

Limitations

1. Lack of random selection. Because participants will be chosen from the Southeastern region of the United States, results may not be generalizable to other groups of people.

Delimitations

1. Ages 18-25 females
2. Georgia Southern University Students

Assumptions

1. Participants will follow instructions to exercise according to their assigned group.
2. Participants will answer questionnaires honestly.
3. Participants will give maximum effort throughout the course of the study.

4. Participants in the control group will maintain their sedentary lifestyle throughout the course of the study.

Operational Definitions

1. Sedentary for the purpose of this study means the participants have not participated in exercise regularly in the last six months.
2. SPA refers to discomfort due to others' observations or evaluations of their physique. For the purpose of this study SPA will be measured by the SPA Scale (SPAS).
3. Physical self-efficacy refers to how one perceives his/her physical ability and how great his/her confidence in presentation of his/her physical skills. For the purpose of this study physical self-efficacy will be measured by the Physical Self-Efficacy Scale (PSE).
4. Underweight refers to participants that had a BMI of 18.4 kg/m^2 and below.
5. Normal weight refers to participants that had a BMI of $18.5\text{-}24.9 \text{ kg/m}^2$.
6. Overweight refers to participants that had a BMI of $25.0\text{-}29.9 \text{ kg/m}^2$.
7. Obese refers to participants that had a BMI of 30 kg/m^2 and above.

APPENDIX B

Extended Review of Literature

The purpose of this study is to examine if resistance exercise has an effect on SPA and physical self-efficacy. Therefore, the purpose of this review of literature is to investigate past research about SPA and physical self-efficacy and its relationship to resistance exercise.

Psychological Health

Exercise plays an important role in psychological health. The International Society of Sport Psychology (1992) states that psychological benefits include positive changes in self-perception and well-being, improvements in self-confidence and awareness, positive changes in mood, relief of tension, relief of anxiety and depression, influence in pre-menstrual tension, increased sense of mental well-being, increased alertness and clear thinking, increase in energy and ability to cope with daily activity, increased enjoyment of exercise and social contacts, and developing positive coping strategies. Also, Vickers-Douglas (2003) says exercise can work in numerous ways. Among those ways are improved accomplishments and confidence, positive distraction, improved self-esteem, positive pairings, environmental reinforcement, and positive coping skills.

For example, Paluska and Schwenk (2000) found that increased aerobic power and strength training have been found to reduce depressive symptoms. A more cheerful mood, less stress, and a higher self-esteem are often reported by regular exercisers than non-exercisers (Miller, 2003). Researchers suggest this effect may be due to the psychological gains from the experience of getting in shape rather than the actual increase in aerobic fitness (Plante, 1999). Perhaps, participants of exercise feel good about their participation, ultimately leading to more positive psychosocial functioning.

King (1989) investigated the psychological changes that occurred on 120 sedentary, apparently healthy men and women. The participants were randomly placed into either a six month aerobic training group or an assessment program. Results revealed that regular exercise improved perceived fitness and satisfaction with physical appearance significantly. Therefore, there is some evidence that regular exercise decreases depressive symptoms. Furthermore, exercise is shown to improve mental health and well-being, as well as reduce depression and anxiety (Callaghan, 2004).

Social Physique Anxiety

Social Physique Anxiety relates to the anxiety that occurs when one feels his or her body is being negatively evaluated (McAuley, Schaffer, & Rudolph, 1995). People like to garner social approval. Furthermore, they exercise to make a desired impression. Individuals are taught to maintain or improve physical appearance in order to gain a particular social image. Therefore, many strive to be socially accepted, in other words, to be thin, sexy, shapely, and fit. Indeed, the public display of the body, whether in locker rooms, near swimming pools, or the high school gym is not a happily anticipated experience.

These concerns, however, could lead to the opposite side of the coin - physical inactivity. Many people cite intimidation as a reason for not exercising (Eklund & Crawford, 1994). For one with high SPA, the fear is overwhelming when one thinks that his or her body might be evaluated.

The Social Physique Anxiety Scale (SPAS) was originally a 12-item scale developed to measure SPA. A pool of questions were generated that dealt specifically with social anxiety. Each question was answered based on how true that statement was

for each individual. The individual would rate how anxious he or she was about the statement on a 5-point Likert scale. Statements included “I am comfortable with the appearance of my physique”, “My physique makes me nervous in certain social settings”, and “I usually feel relaxed when others are looking at my physique” (McAuley & Burman, 1992). The SPAS was found to be helpful in measuring SPA (Hart, Leary, & Rejeski, 1989). However, later research indicated problems with validity, wording, and stability of the scale.

Martin, Rejeski, Leary, McAuley, and Bane (1997) questioned the multidimensional model. They found a few items related more towards body satisfaction and others’ caused confusion among participants. Later, Motl and Conroy (2000) eliminated items 11 and 12 due to positively and negatively worded statements which affected scoring. This left a 7-item scale. Motl and Conroy’s (2000) study presents correlations that provide evidence for modest discriminant validity. Scott, Burke, Joyner, and Brand (2004) examined the stability of the 7-item SPAS. They recruited 201 college-aged participants from a southeastern university to participate in the study. These participants completed two administrations of the SPAS-7. The two administrations were separated by two weeks. Results revealed the SPAS-7 was a reliable scale to measure SPA. Motl and Conroy (2001) recruited 1,053 participants from previous studies to make an attempt to cross-validate the 7-item scale. Results revealed the invariance adds to the ability to make meaningful comparisons across men and women alike, on the construct of SPA. They report researchers can employ the SPAS-7 with confidence in studies of SPA among teenage and young adult men and women.

Eklund and Crawford (1994) conducted a study to examine the relationship between SPA, exercise and active women. They recruited 94 college-aged women to watch exercise videos and answer subsequent questionnaires. Questionnaires included the SPAS, Reasons for Exercise Inventory (REI), Exercise Behaviors and Preferences, and Attitudes Towards Exercise Settings (ATES). Upon completion of demographic data, female participants were asked to view an exercise video and complete the appropriate ATES questionnaire. Results revealed that most prefer to exercise in a setting that requires shorts and t-shirt as opposed to fewer clothes. Furthermore, many people avoid exercising due to feelings of intimidation and apprehension of being observed.

To study whether aerobic exercise had an effect on SPA, McAuley, Schaffer, & Rudolph (1995) recruited 114 participants (male = 56, female = 58) to participate in a 20-week program. Body fat and circumference measurements were performed on each participant prior to the start of the program. Each participant completed health history and demographic questionnaires, as well as the SPAS. Participants were then given an individualized exercise program. This program included brisk walking, three times per week for one hour. At the end of the 20 weeks, participants completed the SPAS again.

Results revealed correlations between weight, body fat, and circumferences for both men and women. The study also revealed women were more physique anxious than men ($r = -.35$ and $-.32$, $p < .005$) and younger subjects were more anxious than older subjects ($r = .52$ and $-.27$, $p < .001$). Physique anxiety significantly correlated with body fat and circumferences. In other words, participants with higher body fat and hip and waist circumferences experienced more SPA.

McAuley and colleagues (2002) conducted a study to examine effects of physical activity on physique anxiety in older adults. They recruited 174 participants (49 males, 125 females) to participate in a six-month randomized controlled exercise trial. These participants were sedentary, older adults (mean age = 65.5 years). Each participant completed a questionnaire including demographic information as well as details about his/her medical history. Participants were then randomly assigned to one of two groups: Aerobic group or Stretching and Toning group. Aerobic exercise classes were taught three times a week for six months by a trained exercise professional and included brisk walking. The exercise intensity began at 50 – 55% VO_2max and increased to 65% VO_2max by the end of three months. Intensity levels were prescribed based on maximal responses to physiological testing and heart rate and perceived exertion levels. The exercise class lasted 10-15 minutes in the beginning of the six months and increased to 40 minutes by the end of the six months. Stretching and toning exercise classes were also taught by a trained exercise professional three times a week for six months. The program consisted of strengthening exercises of one set for 8-12 reps for each major muscle group and flexibility exercises for all major muscle groups held for 20-30 seconds. Each class lasted 40 minutes with a 10 minute warm-up and cool-down. Results showed an overall adherence rate of 88%. The program consisted of 70 days with the mean number of days attended at 56.67 (SD = 14.14). There was no significant difference in SPA growth between treatment conditions. There was, however, a significant difference in SPA growth over time. This difference indicated a significant reduction in SPA over time. Therefore, it would be concluded that physical activity does have an effect on SPA. It

would also be concluded that the longer a person exercises (in months) the lower will be his/her SPA.

Williams and Cash (2001) studied the effects of circuit weight training on the body images of college students. They recruited 39 participants (27 female and 12 male) from an academic weight training class located in a large mid-Atlantic university. Mean age was 21.7 years ($SD = 3.8$). Participants were grouped based on aerobic exercise levels: (a) “regular aerobic exercisers”, engaged in cardiovascular exercise three times a week for 20 minutes (b) “irregular aerobic exercisers”, engaged in cardiovascular exercise on occasion (< 3 times per week) and (c) “aerobic non-exercisers”, did not engage in cardiovascular exercise. Sixty-four control subjects were recruited from the same university. Prior to the study participants completed a demographic questionnaire, exercise history form, Multidimensional Body-Self Relations Questionnaire (MBSRQ), SPA Scale (SPAS), Physical Self-Efficacy Scale (PSE), Reasons for Exercise Inventory (REI), and Muscular Strength Assessment. The circuit weight training class met three hours per week for six weeks. While there, students engaged in exercises to strengthen and tone the entire body. The student increased the amount of weight lifted according to his/her progress. All assessments were measured following the six-week period.

Results showed a significant effect for Group and Time as well as Group by Time interaction. ANOVAs confirmed interactions for all four body image measures. Simple effects F tests revealed a significant difference between groups at pretest only, with the weight lifters experiencing greater initial body dissatisfaction. Weight lifters improved body image on all four measures. However, control participants reported no changes in

body image over time. As hypothesized, the students reported significant improvements in their evaluations of their physical appearance and in their body satisfaction.

According to Monteath and McCabe (1997), there is a perceptual and an attitudinal component to body image. The perceptual component is reflected in distorted perceptions of body size, shape, or appearance. The attitudinal component results in dissatisfaction with body appearance or functional capacity. Therefore, they measured the relationship between societal factors and body image. The researchers used a video camera apparatus to measure perceptual distortion of body size, satisfaction with body size, and perception of the societal body ideal of 101 Australian women. Each participant was instructed to adjust the image, by turning a knob, that appeared on the television screen to represent her perceived body size. The researchers also used the camera apparatus to measure body satisfaction by subtracting each participant's perceived actual body size from her ideal body size. Lastly, Monteath and McCabe (1997) asked each participant to adjust the image on the screen to represent the societal ideal to measure societal body ideal. Results revealed that 94% of the sample expressed a strong desire to be smaller than their perceived actual sizes, 5% were content with their current sizes, and only 1% expressed a desire to be larger. Responses to a Body Esteem Scale (BES) revealed that 44% expressed moderate to strong negative feelings about different parts of their bodies, 39% expressed moderate to strong negative feelings about their bodies as a whole. Nearly all women (96%) perceived themselves to be larger than the societal ideal.

Krane and colleagues (2002) studied 198 female exercisers and 204 female athletes from a Mid-western University. The study was designed to examine body satisfaction, eating behaviors, SPA, and perfectionism. Participants self-reported

exercising an average of 257.96 minutes per week ($SD = 237.08$) with most of their time committed to aerobic exercise ($M = 180.24$ minutes, $SD = 225.51$). Athletes were divided into three groups: (a) revealing uniform, body shape was easily observable in a form-fitting uniform, (b) baggy uniform, body shape was not easily observable with loose fitting tops and bottoms, and (c) mixed uniform, baggy tops with tight or brief shorts or skirts. Participants completed the Eating Disorders Inventory (EDI) and SPA. Results revealed there were no significant differences between the groups for drive for thinness or perfectionism. Multiple regression analyses examined if body dissatisfaction, drive for thinness, perfectionism, and SPA were related to the time per week engaged in exercise. There were no significant findings for exercisers or athletes. However, regression equations did indicate body dissatisfaction, drive for thinness, and perfectionism were related to SPA.

Lantz and Hardy (1997) examined the relationship between SPA and exercise behavior. Data were collected on 300 participants (120 males and 180 females) with a mean age of 25.7 years ($SD = 9.7$). Participants completed the SPAS, Beck Depression Inventory (BDI), and the Minnesota Heart Health Program Leisure Time Physical Activity Questionnaire (MHHP). Correlation analyses indicated a significant relationship between SPAS and MHHP for men. As SPA scores increased, MHHP scores decreased. Furthermore, as SPA scores increased, exercise behavior decreased. Regression analyses revealed that SPAS scores, along with gender, age, and depression gave the best prediction of exercise behavior. One could imagine, if an exerciser is feeling fearful or negatively evaluated, the exerciser will protect his or her self by not exercising. This is only human nature.

On a different note, Russell and Cox (2003) studied the differences in SPA between Caucasians and African Americans. They recruited 168 participants (63 African Americans, 105 Caucasians) from a mid-western university. Participants completed demographic information as well as the Rosenberg's Self-Esteem Scale, the Body Cathexis Scale, and the SPA Scale. Results revealed the overall sample had a mean aerobic exercise frequency of 2.76 days per week, which does not meet the guidelines set by the American College of Sports Medicine (ACSM). African American women had a higher actual weight and perceived weight than did Caucasians. However, African Americans scored significantly lower on the SPAS ($M = 35.87$, $SD = 8.69$) than Caucasians ($M = 39.40$, $SD = 8.34$). African Americans also scored significantly higher on the self-esteem scale ($M = 34.87$, $SD = 4.01$) than Caucasians ($M = 32.28$, $SD = 5.09$).

This finding may suggest that African American women are less vulnerable to self-presentation concerns. African American women report a greater flexibility in body ideal than Caucasian women. It is also reported that "looking good" has a different meaning to African Americans when compared to Caucasians. "Looking good" relates to public image and personality, rather than ones' physique. Perhaps, African Americans have not adopted a large cultural stereotype and internal standard for the ideal body. African Americans, therefore, may have a protective measure against body dissatisfaction and SPA (Russell & Cox, 2003).

Physical Self-efficacy

Self-efficacy is related to feelings of mastery one has regarding a particular task. Therefore, physical self-efficacy is related to feelings of mastery one has regarding physical tasks, such as balance. Self-efficacy plays a key role in emotions, thought

patterns and behavior (Ryckman, Robbins, Thornton, & Cantrell, (1982). Perceived self-efficacy plays a role as well. It will influence the choice of activity, as well as, affect persistence of an activity once it is initiated, through expectations. This may determine eventual success. Efficacy expectations can determine how much effort an individual puts forth upon an obstacle (Bandura, 1977). Therefore, an individual may not exercise as vigorously when faced with challenge, which can lead to the amount of change that is experienced.

Physical self-efficacy is important because it is connected to physical competence and physical acceptance. When and if physical self-efficacy can be changed then there is the potential to change overall self-esteem. Sonstroem and Morgan (1988) studied different models of self-esteem and how it can be changed. One model stated that self-esteem was made up of physical self-efficacy which includes physical competence and physical acceptance. Then through an intervention, exercise in this case, self-esteem could be improved. An improvement in physical self-efficacy would lead to an improvement in physical competence and physical acceptance, both of which improve self-esteem in the end.

Emotional arousal can also have an effect on performance of a particular activity. If an individual is experiencing anxiety, performance may be poor (Bandura, 1977). Since an exercise setting typically presents a certain amount of anxiety in individuals, the participant may be less able to perform to maximum level. Furthermore, participants that experience anxiety in exercise settings may not be able to experience changes in self-efficacy.

The physical self-efficacy scale was created to measure each aspect of self-efficacy independently. Questions include “I have excellent reflexes”, “I can’t run fast”, and “Athletic people usually do not receive more attention than me”. Reliability alphas *t-tests* are highly satisfactory for the overall PSE and its subscales (PPA and PSPC) (Garner et al., 1980). The scale also showed good concurrent validity.

In the study mentioned earlier by Williams and Cash (2001) there was a significant increase for physical self-efficacy after a six-week exercise period. These differences were not seen in the control group.

Miller, Ogletree, and Welshimer (2002) conducted a study on the impact of activity behaviors on physical activity identity and self-efficacy. A total of 900 surveys were mailed to employees of a Midwestern university. A total of 409 surveys were included for the data analysis. Four instruments, Physical Activity Assessment Tool, Exercise Identity Scale, Physical Activity Self-efficacy scale, and demographic questionnaire, were combined to make the survey packet.

Results showed significant differences in scores on Physical Activity Identity (PAI) and Physical Activity Self-efficacy (PASE) based on activity level. Post hoc analysis further revealed that vigorous and moderate activity groups differed from sedentary and irregular activity groups and from each other in mean score on PAI and PASE. Participants that reported exercising more vigorously scored higher on the PAI and PASE. Hierarchical regression analysis (HRA) revealed that activity level explained 34% of the variance in PAI. Length of time of adherence explained an additional 3% of the variance in scores on PAI. These results indicate activity level explained a greater percentage of the variance in scores on PAI than did length of time of adherence,

controlling for age, gender, education, and race. In the second HRA, scores on PASE were regressed on two blocks of variables, activity level and length of time of adherence. Results revealed that activity level explained 32% of the variance in PASE. Length of time of adherence explained 3% of the variance in PASE. Similar to the first HRA, results indicate activity level explained a greater percentage of the variance in scores on PASE than length of time of adherence.

Dishman (2003) examined the relationship of level of physical activity in which one engages and the length of time of adherence to physical activity with physical activity identity and physical self-efficacy. A total of 409 surveys were collected from participants at a large mid-western university. Instruments included the Physical Activity Assessment Tool, the Exercise Identity Scale/Physical Activity Identity Scale (PAI), the Physical Self-Efficacy Scale (PSE) and a demographic data sheet. Results revealed significant differences in scores on PAI and PSE based on activity level ($p < .001$). Tukey's post hoc analysis revealed that vigorous and moderate activity groups differed from sedentary and irregular activity groups ($p < .001$). These findings suggest PAI and PSE scores were dependent upon activity level, with more positive PAI and PSE scores coming from more vigorously active participants.

McAuley, Schaffer, and Rudolph (1995) examined the relationship between self-efficacy and responses after just 10 minutes of aerobic exercise in patients at a Veterans Administration Medical Center. Results revealed that older subjects' self-efficacy increased over time, whereas, younger subjects experienced a decrease or no change. It was also reported that subjects that had higher self-efficacy before exercise experienced an increase in self-efficacy after exercise. However, individuals that went into the

exercise with poor self-efficacy, did not experience significant changes post-exercise. Perhaps, the duration of exercise was not enough to generate changes in those with poor self-efficacy.

Later, Rudolph and Butki (1998) examined the effects of 10, 15, and 20 minute exercise durations on physical self-efficacy. The researchers recruited 36 women from a southeastern university. Subjects were intermediate exercisers, neither sedentary nor trained. Inclusion criteria consisted of the subject participating in aerobic exercising three days per week for 20 minutes for the past 6 months. After completing demographic data and informed consent forms, participants were asked to complete the self-efficacy scale. Participants were then instructed to run on a treadmill at an RPE of 13 (somewhat hard) on the Borg Scale for the appropriate time according to the group to which they were assigned, 10, 15, or 20 minutes. The self-efficacy scale was re-administered at the completion of the exercise session.

Results showed an increase in self-efficacy from pre to post across all groups ($p < .001$). Results also indicated that pre and post exercise self-efficacy was significantly associated with a positive well-being after exercise. Post exercise self-efficacy was inversely related to fatigue. Furthermore, participants that experienced higher self-efficacy also reported being less fatigued. Effect sizes were determined for the 15 and 20 minute groups, .36 and .68 respectively. It is suggested that a larger effect size would produce larger effects for the 20 minute group when compared to the 15 minute group.

Relationship of SPA to Physical Self-Efficacy

McAuley and Burman (1992) found that individuals with lower levels of perceived physical ability and confidence showed greater levels of SPA. They recruited

236 gymnasts to participate in the study. Participants completed the SPAS and the PSES as well as demographic information and informed consent. They found that SPA was inversely correlated with PPA.

REFERENCES

- Bandura, A., Adams, N. E., & Beyer, J. (1977). Cognitive processes mediating behavioral change. *Journal of Personality and Social Psychology*, 35, 125-139.
- Callaghan, P. (2004). Exercise: A neglected intervention in mental health care? *Journal of Psychiatric and Mental Health Nursing*, 11, 476-483.
- Dishman, K. (2003). The impact of behavior on quality of life. *Quality of Life Research*, 12, 43-49.
- Eklund, R. C., & Crawford, S. (1994). Active women, SPA, and exercise. *Journal of Sport & Exercise Psychology*, 16, 431-448.
- Garner, D. M., Garfinkel, P. E., Schwartz, D., & Thompson, M. (1980). Cultural expectations of thinness in women. *Psychological Reports*, 47, 483-491.
- Hart, E. A., Leary, M. R., & Rejeski, W. J. (1989). The measurement of SPA. *Journal of Sport & Exercise Psychology*, 11, 94-104.
- International Society of Sport Psychology (1992). Physical activity and psychological benefits: A position statement. *The Sport Psychologist*, 6, 199-203.
- King A. C., Taylor C. B., Haskell, W. L., et al. (1989). Influence of regular aerobic exercise on psychological health: A randomized, controlled trial of healthy, middle-aged adults. *Health Psychological*, 8, 305-24.
- Krane, V., Stiles-Shipley, J. A., Waldron, J., & Michalenok, J. (2002). Relationships among body satisfaction, SPA, and eating behaviors in female athletes and exercisers. *Journal of Sport Behavior*, 24, 247-264.
- Lantz, C. D. & Hardy, C. J. (1997). Social physique anxiety and perceived exercise behavior. *Journal of Sport Behavior*, 20, 83-94.

- Martin, K. A., Rejeski, W. J., Leary, M. R., McAuley, E., & Bane, S. (1997). Is the Social Physique Anxiety Scale really multidimensional? Conceptual and statistical arguments for a unidimensional model. *Journal of Sport & Exercise Psychology, 19*, 359-367.
- MayoClinic. (2003, November 5). Exercise eases symptoms of anxiety and depression. Retrieved October 20, 2005, from www.articles.health.msn.com
- McAuley, E., Bane, S. M., Rudolph, D. L., & Lox, C. L. (1995). Physique anxiety and exercise in middle-aged adults. *The Journals of Gerontology, 50*, 229-235.
- McAuley, E. & Burman, G. (1992). The SPA Scale: Construct validity in adolescent females. *Medicine & Science in Sports & Exercise, 25*, 1049-1053.
- McAuley, E., Marquez, D., Jerome, G., Blissmer, B., & Katula, J. (2002). Physical activity and physique anxiety in older adults: fitness, and efficacy influences. *Aging & MentalHealth, 6*, 222-230.
- McAuley, E., Schaffer, S. M., & Rudolph, D. L. (1995) Affective responses to acute exercise in elderly impaired males: The moderating effects of self-efficacy and age. *The international Journal of Aging and Human Development, 41*, 13-27.
- Miller, K., Ogletree, R., & Welshimer, K. (2002). Impact of activity behaviors on physical activity identity and self-efficacy. *American Journal of Health Behavior, 26*, 323-330.
- Miller, M. (2003). Is exercise good for depression? *Harvard Mental Health Letter, 19*, 8.
- Monteath, S. A., & McCabe, M. P. (1997). The influence of societal factors on female body image. *The Journal of Social Psychology, 137*, 708-727.

- Motl, R. W., & Conroy, D. E. (2000). Validity and factorial invariance of the Social Physique Anxiety Scale. *Medicine & Science in Sports & Exercise*, 32, 1007-1017.
- Motl, R. W., & Conroy, D. E. (2001). The SPA scale: Cross validation, factorial invariance, and latent mean structure. *Measurement in physical education and exercise science*, 5, 81-95.
- Paluska, S. A., & Schwenk, T. L. (2000). Physical activity and mental health: Current concepts. *Sports Medicine*, 29, 167-180.
- Plante, T. G. (1999). Advances in mind. *Body Medicine*, 15, 291-296.
- Rudolph, D. L., & Butki, B. D. (1998). Self-efficacy and affective responses to short bouts of exercise. *Journal of Applied Sport Psychology*, 10, 268-280.
- Russell, W. D., & Cox, R. H. (2003). SPA, body dissatisfaction in self-esteem in college females of differing exercise frequency, perceived weight discrepancy, and race. *Journal of Sport Behavior*, 26, 298-318.
- Ryckman, R. M., Robbins, M. A., Thornton, B., & Cantrell, P. (1982). Development and validation of a physical self-efficacy scale. *Journal of Personality and Social Psychology*, 42, 891-900.
- Scott, L. S., Burke, K. L., Joyner, A. B., & Brand, J. S. (2004). Examining the stability of the 7-item SPA scale using a test-retest method. *Measurement in Physical Education and Exercise Science*, 8, 57-62.
- Sonstroem, R. J. & Morgan, W. P. (1988). Exercise and self-esteem: Rationale and model. *Medicine and Science in Sports and Exercise*, 21, 329-336.

Williams, P., & Cash, T. (2001). Effects of a circuit weight training program on the body images of college students. *International Journal of Eating Disorders*, 30, 75-82.

APPENDIX C

Instrumentation

Demographic Questionnaire

Name: _____

Age: _____

Weight: _____

Height : _____

Exercise Habits: Circle One

3+ times per week 1 time per week Occasionally Never

Classification: Circle One

Freshman Sophomore Junior Senior Graduate Student

PAR-Q & YOU

(A Questionnaire for People Aged 15 to 69)

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

Yes No

- 1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?**
- 2. Do you feel pain in your chest when you do physical activity?**
- 3. In the past month, have you had chest pain when you were not doing physical activity?**
- 4. Do you lose your balance because of dizziness or do you ever lose consciousness?**
- 5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?**
- 6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?**
- 7. Do you know of any other reason why you should not do physical activity?**

If you answered YES

Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.

- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

DELAY BECOMING MUCH MORE ACTIVE:

- if you are not feeling well because of a temporary illness such as a cold or a fever – wait until you feel better; or
 - if you are or may be pregnant – talk to your doctor before you start becoming more active.
- If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:
- start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.
 - take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

"I have read, understood and completed this questionnaire. Any questions I had were answered to my full satisfaction."

NAME _____

SIGNATURE _____ DATE _____

SIGNATURE OF PARENT _____ WITNESS _____

SELF-EVALUATION QUESTIONNAIRE

Directions: Below is a list of statements which people have used to describe themselves. Please read each statement and circle the appropriate response. Circling "1" indicates that you agree strongly with the statement; circling "6" indicates that you strongly disagree with the statement.

1. I have excellent reflexes.
Strongly agree 1 2 3 4 5 6 Strongly disagree
2. I am not agile and graceful.
Strongly agree 1 2 3 4 5 6 Strongly disagree
3. I am rarely embarrassed by my voice.
Strongly agree 1 2 3 4 5 6 Strongly disagree
4. My physique is rather strong.
Strongly agree 1 2 3 4 5 6 Strongly disagree
5. Sometimes I don't hold up well under stress.
Strongly agree 1 2 3 4 5 6 Strongly disagree
6. I can't run fast.
Strongly agree 1 2 3 4 5 6 Strongly disagree
7. I have physical defects that sometimes bother me.
Strongly agree 1 2 3 4 5 6 Strongly disagree
8. I don't feel in control when I take tests involving physical dexterity.
Strongly agree 1 2 3 4 5 6 Strongly disagree
9. I am never intimidated by the thought of a sexual encounter.
Strongly agree 1 2 3 4 5 6 Strongly disagree
10. People think negative things about me because of my posture.
Strongly agree 1 2 3 4 5 6 Strongly disagree
11. I am not hesitant about disagreeing with people bigger than me.
Strongly agree 1 2 3 4 5 6 Strongly disagree
12. I have poor muscle tone.
Strongly agree 1 2 3 4 5 6 Strongly disagree
13. I take little pride in my ability in sports.
Strongly agree 1 2 3 4 5 6 Strongly disagree

14. Athletic people usually do not receive more attention than me.
Strongly agree 1 2 3 4 5 6 Strongly disagree
15. I am sometimes envious of those better looking than myself.
Strongly agree 1 2 3 4 5 6 Strongly disagree
16. Sometimes my laugh embarrasses me.
Strongly agree 1 2 3 4 5 6 Strongly disagree
17. I am not concerned with the impression my physique makes on others.
Strongly agree 1 2 3 4 5 6 Strongly disagree
18. Sometimes I feel uncomfortable shaking hands because my hands are clammy.
Strongly agree 1 2 3 4 5 6 Strongly disagree
19. My speed has helped me out of some tight spots.
Strongly agree 1 2 3 4 5 6 Strongly disagree
20. I find that I am not accident prone.
Strongly agree 1 2 3 4 5 6 Strongly disagree
21. I have a strong grip.
Strongly agree 1 2 3 4 5 6 Strongly disagree
22. Because of my agility I have been able to do things which many others could not do.
Strongly agree 1 2 3 4 5 6 Strongly disagree

SOCIAL PHYSIQUE ANXIETY SCALE

Please read each item and then indicate on the following scale the degree to which the statement is a characteristic of you.

- | 1 | 2 | 3 | 4 | 5 |
|------------|---|------------|------|-----------|
| not at all | slightly | moderately | very | extremely |
| 1. _____ | I wish I was not so uptight about my physique/figure. | | | |
| 2. _____ | There are times when I am bothered by thoughts that other people are evaluating my weight or muscular development negatively. | | | |
| 3. _____ | Unattractive features of my physique/figure make me nervous in certain social settings. | | | |
| 4. _____ | In the presence of others, I feel apprehensive about my physique/figure. | | | |
| 5. _____ | I am comfortable with how fit my body appears to others. | | | |
| 6. _____ | It would make me uncomfortable to know others were evaluating my physique/figure. | | | |
| 7. _____ | When it comes to displaying my physique/figure to others, I am a shy person. | | | |

APPENDIX D

Informed Consent Form

COLLEGE OF HUMAN SCIENCES**Georgia Southern University****Jiann-Ping Hsu School of Public Health**

INFORMED CONSENT

I, Michele Martin, a graduate student in the Jiann-Ping Hsu School of Public Health at Georgia Southern University, conducts this research study to investigate the effects resistance exercise has on social physique anxiety and physical self-efficacy.

The purpose of this study is to investigate the effects resistance exercise has on social physique anxiety and physical self-efficacy. Also of interest are the potential physiological effects of weight training over a 3 week period.

You will be asked to complete a questionnaire including Name, Age, Weight, Height, Race, and Year in school. You will also be asked to complete the Social Physique Anxiety Scale (7 questions) and the Physical Self-Efficacy Scale (21 Questions). Completion and return of the survey, questionnaire, etc. implies that you agree to participate and your data may be used in this research. You will also be asked to allow a measurement of your waist, hip, and thigh be taken to assess physiological changes.

There are few risks involved in participating in the research beyond those experienced in everyday activity. Muscle injuries (strains) may occur. However, the researcher will conduct an introductory session to instruct operation of equipment, appropriate exercise technique, and appropriate weight to lift.

By participating in this study you may have a better understanding of how to exercise correctly. You may learn why exercise is important. You may experience improvements in psychological factors such as body image (Social Physique Anxiety) and confidence to accomplish tasks to the desired level (Physical Self-Efficacy). You may experience physiological changes such as decreased waist, hip, and/or thigh size. This research might provide a better understanding of exercise and how it affects people psychologically. This information could help to prevent particular psychological disorders later in life.

It will take approximately a total of 15 minutes to complete all three questionnaires. It will take 30 minutes, 3 days per week to perform the exercise activity in which you are assigned.

Only the person in charge, and his/her assistants, will know your identity. If this research is published, no information that would identify you will be used.

You can ask questions about the research. The person in charge will answer your questions. Contact Michele Martin at 681-5436 with questions. If you have questions about your rights as a research participant, contact the Office of Research Services and Sponsored Programs at 912/681-7758, or 0843.

Voluntary Participation: You do not have to participate in this research. You can end your participation at any time by telling the person in charge. You do not have to answer any questions you do not want to answer.

Penalty: There is no penalty for deciding not to participate in this study. You may decide at any time you don't want to participate further and may simply withdraw.

You must be 18 years of age or older to consent to participate in this research study. If you consent to participate in this research study and to the terms above, please sign your name and indicate the date below.

"Because the validity of the results of the study could be affected if the purpose of the study is fully divulged to me prior to my participation, I understand that the purpose of the study cannot be explained to me at this time. I understand that I will have an opportunity to receive a complete explanation of the study's purpose following the completion of the study."

"I understand that medical care is available in the event of injury resulting from research but that neither financial compensation nor free medical treatment is provided. I also understand that I am not waiving any rights that I may have against the University for injuries resulting from negligence of the University or investigators."

You will be given a copy of this consent form to keep for your records.

Title of Project: Investigation of Effects of Resistance Exercise on Social Physique
Anxiety and

Physical Self-Efficacy

Principal Investigator: Michele Martin, PO Box 8078, 912-681-5436,
mymartin429@hotmail.com

Faculty Advisor: Dr. Barry Joyner, P.O. Box 8076, Statesboro, GA 30460, 912-681-0775,
joyner@georgiasouthern.edu

Participant Signature

Date

The informed consent procedure has been followed.

Investigator Signature

Date

APPENDIX E

IRB Form

Georgia Southern University Office of Research Services & Sponsored Programs Institutional Review Board (IRB)		
Phone: 912-681-5465		Administrative Annex
		P.O. Box 8005
Fax: 912-681-0719	Ovrsight@GeorgiaSouthern.edu	Statesboro, GA 30460

To: Michele Martin
511 Zetterower Rd. #1
Statesboro, GA 30458

cc: Barry Joyner, Faculty Advisor
P. O. Box 8076

From: Office of Research Services and Sponsored Programs
Administrative Support Office for Research Oversight Committees
(IACUC/IBC/IRB)

Date: May 18, 2005

Subject: Status of Application for Approval to Utilize Human Subjects in Research

After a review of your proposed research project numbered: **H05156**, and titled "**The Effects of Resistance Exercise on Social Physique Anxiety and Self-Efficacy**", it appears that (1) the research subjects are at minimal risk, (2) appropriate safeguards are planned, and (3) the research activities involve only procedures which are allowable.

Therefore, as authorized in the Federal Policy for the Protection of Human Subjects, I am pleased to notify you that the Institutional Review Board has approved your proposed research.

This IRB approval is in effect for one year from the date of this letter. If at the end of that time, there have been no changes to the research protocol, you may request an extension of the approval period for an additional year. In the interim, please provide the IRB with any information concerning any significant adverse event, **whether or not it is believed to be related to the study**, within five working days of the event. In addition, if a change or modification of the approved methodology becomes necessary, you must notify the IRB Coordinator **prior** to initiating any such changes or modifications. At that time, an amended application for IRB approval may be submitted. Upon completion of your data collection, you are required to complete a *Research Study Termination* form to notify the IRB Coordinator, so your file may be closed.

Sincerely,



Julie B. Cole
Director of Research Services and Sponsored Programs